



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,758	04/28/2006	Lisebeth Van Pieterse	NL031297US1	6966
24737 7590 04/28/2009 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER VERDERAME, ANNA L.				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
04/28/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/577,758

Applicant(s)

VAN PIETERSON ET AL.

Examiner

ANNA L. VERDERAME

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11 and 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/13/2008 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112: The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite that the further substrate covers the third auxiliary layer/reflective layer. This is indefinite. In figure 1, for example, the applicant shows that the second auxiliary layer 5 is covering the third auxiliary layer 8. By reciting a "further substrate" the examiner believes that the applicant is referring to substrate 7. This substrate is covering the first auxiliary layer in the disc as shown in figure 1. The term covering is also confusing because if you flip the disc in figure 1 the first auxiliary layer is covering the substrate. In the description of figure 1 at (0034-0035). The substrate 7 is referred to as "a substrate 7" at (0034) and as "a second substrate 7" at (0035). At section (0035) the second

Art Unit: 1795

substrate 7 is said to be present adjacent to the third auxiliary layer 6. This is not true based on the drawing. This claim is confusing because it is unclear from the description, the drawing and the claims whether the further substrate referred to is substrate 7. If applicant intends for layer 7 to correspond to the "further substrate", the examiner suggests reciting that the further substrate is provided adjacent to the first auxiliary layer.

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. 200310214857 in view of Sakaue et al. US 2002/10168587.

In example 15 an optical recording medium comprising an 80 nm thick $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$ first auxiliary layer, a 18 nm Ge-Sn-Sb recording layer, a 17 nm $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$ second auxiliary layer, a 3nm thick GeN fourth auxiliary layer, and a 150 nm Ag third auxiliary layer.

In example 15 a $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$ upper dielectric layer1 second auxiliary layer is formed to have a thickness of 17 nm. This layer will have a ratio of λ/d of $5.1 \times 10^8 \text{ W m}^{-2} \text{ K}^{-2}$. λ for $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$ can be found in applicant's specification.

The Ge-N layer was placed between the reflective layer and the $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$ second auxiliary layer to prevent mutual diffusion of elements(0277). . It is the position of the examiner that the 3nm thick GeN layer acts as an anti-sulfuration layer between the sulfur containing upper protective layer and the Ag reflective layer.(heat sink layer)

With regard to the limitations of claims 2-3 and 13 , Horie et al. discloses materials for the protective layers (first and second auxiliary layers) and thicknesses for the upper protective layer(second auxiliary layer) at (0137-0138 and 0143). Use of SiN as the dielectric material for the protective layers is taught at (01 38). Nitrides of Hf ,Si, or Ge as materials to form the protective layer are taught at (0137) . Oxides of TA, In, or Sn are also taught at (0137). Horie et al. specifically discloses SiN(equivalent to Si_3N_4) as an alternative material for the protective layers. Also, Horie et al. discloses that the upper protective layer can have a thickness of preferably at least 5 nm. This disclosure meets the limitation of claim 2 which requires a thickness of less than 10 nm. The upper protective layer of $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$ having a thickness in the range of 1-9 nm will meet the limitations recited in instant claims 1-2 and 13. Though Horie et al. may be silent in regard to setting a ratio between the heat conduction and the thickness of the upper protective layer, Horie et al. teaches materials and thicknesses for the upper protective layer that are identical to those taught by the applicant. A $(\text{ZnS})_{80}\text{-(SiO}_2\text{)}_{20}$

Art Unit: 1795

having a thickness in the range of 1-9 nm will inherently possess the qualities recited in instant claim 1. As with the applicant's invention, the media of Horie et al. are capable of high speed recording.

With regard to the limitation of claim 4, the examiner points out that several examples shown in tables 4 and 5 disclose recording layers of 15 and 16 nm. A recording layer having a thickness of 15 nm touches the applicant's range of less than 15 nm. Further, the examiner notes that in section 0025 Horie et al. discloses a particularly preferable range for the recording layer of from at least 10 nm to at most 20 nm. A recording layer having a thickness of at least 10 nm to at most 14 nm falls within the particularly preferable range disclosed by Horie et al. and also falls within the applicant's range as recited in claim 4.

With regard to the limitation of claims 5-6, in example 8 Horie et al. discloses a recording composition having 64% Sb, 16% Sn, 18% Ge and 2% Ag is taught. This recording composition falls within the applicant's recited range. Also, in example 11 Horie et al. discloses an optical recording medium comprising a 95 nm first protective layer of ZnS-SiO₂, an (Sb_{0.92}Sn_{0.08})₇₇Ge₁₅In_{0.08} (70.84% Sb, 6.16% Sn, 15% Ge, and 8% In) recording layer having a thickness of 18 nm, a second protective layer of ZnS-SiO₂ having a thickness of 27 nm, a GeN layer having a thickness of 3 nm (fourth auxiliary layer) and an Ag reflective layer having a thickness of 200 nm (third

Art Unit: 1795

auxiliary layer)(table 3). This recording composition falls outside the applicant's recited range but contains an additive of claim 5.

A general formula for the recording composition according to this invention is taught in the abstract. Benefits obtained by adding M are taught at (0058-0059).

It would have been obvious to one of ordinary skill in the art to modify the optical recording medium taught in example 11 of Horie et al. by using the phase-change composition of example 8 and forming the recording layer to have a thickness of from 10-14 nm as taught at (0125) with the reasonable expectation of forming a useful recording medium. Further, it would have been obvious to form the upper protective layer of ZnS-SiO₂ to have a thickness of from 1-9 nm based on the disclosure at (0143) and with a reasonable expectation of success. Further still it would have been obvious to one of ordinary skill in the art to alternatively form the upper protective layer having a thickness of from 1-9 nm of Si-N based on the disclosure at (01 38) which establishes ZnS-SiO₂ and Si-N as equivalent alternatives and with the reasonable expectation of success.

The examiner notes that the example where the upper protective layer is an SiN layer formed to a thickness in the range of 9 nm will be indistinguishable from an example wherein an SiN upper protective

Art Unit: 1795

layer(second auxiliary layer) having a thickness of 8, nm and a 1 nm SiN fourth auxiliary layer are formed(emphasis added).

Horie et al. does not explicitly disclose forming a separate fourth auxiliary layer of Si_3N_4 where the fourth auxiliary layer screens the third auxiliary layer from the chemical influence of the second auxiliary layer. The Ge-N interface layer of Horie et al. also do not have a thickness of less than 3 nm as recited in instant claim 11.

Sakaue et al. discloses a recognized problem wherein Ag in the reflective layer or in the recording layer reacts with sulfur atoms in for example a ZnS-SiO₂ layer leading to a phenomenon similar to corrosion(0012, 0037). Provision of a non-sulfur containing protective layer or provision of a non-sulfur containing interface layer is shown to prevent corrosion of the Ag reflective layer(table 1 and elsewhere). An interface film having a thickness of at least 1 nm is shown to prevent corrosion (table 5). Similar results to the case where the interface layer is Ge-N were observed when a nitride of silicon is used (0102-0103).

It would have been obvious to one of ordinary skill in the art to modify embodiment rendered obvious above wherein the medium of example 15 of

Horie et al. has an upper protective layer having a thickness in the range of 1-9 nm by forming the Ge-N layer to have a thickness of at least 1 nm with the reasonable expectation of preventing a reaction between the sulfur atoms in the upper protective layer(second auxiliary layer) and the Ag third auxiliary based on the evidence provided in table 5 in Sakaue et al. Further, it would have been obvious to alternately form the interface layer(fourth auxiliary layer) of Si_3N_4 based on the disclosure in Sakaue et al. that Si_3N_4 also prevents a reaction from occurring between the sulfur atoms in the upper protective layer(second auxiliary layer) and the Ag third auxiliary.

Horie et al. does not specifically disclose a further substrate having a thickness of 0.6 or 0.1 mm. Horie et al. does disclose that the instant invention is applicable to CD-type and DVD-type optical recording media(0004). The medium of Horie et al. is also a top-side read optical disc. This means the medium is read through the side opposite the supporting substrate as illustrated in figure I(b) of Horie et al. Applicant also discloses only a top-side read medium. It is the position of the examiner that provision of a substrate or further protective layer, usually made of plastic, on the medium of figures 1 (a), 1 (b) would be obvious. This assertion is based on the fact that commercially available optical recording media do not have an exposed reflective layer or dielectric material as would be the case in examples I (a) or I (b) and based on the positive result, of protecting the disc

Art Unit: 1795

from damage, which is obtained by providing a protective layer. it is the position of the examiner that Horie et al. intends for the provision of a further substrate/light-transmitting layer/protective layer covering the reflective layer in 1(a) and the dielectric protective layer in I(b). When the protective layer is provided on a top-read disc like that shown in figure I(b) it is commonly referred to as a light-transmitting , light-transmission, or light-transmissive film.

It is further the position of the examiner that thicknesses of 0.6mm and 0.1 mm are standard for DVD-type and Blue-Ray-type discs respectively.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7,105,217- recognizes that Ag reacts with sulfur present in the protective layer. In this case the Ag is part of the recording layer. Solves the problem by providing an interfacial layer made of GeN or Si₃N₄. The interfacial layer has a thickness of at least 1 nm and preferably at least 2 nm(26116-67).

2005/1005375- discloses a DVD having a light-transmitting layer having a thickness of 0.6 mm(0005). The light transmitting layer is equivalent to applicant's layer 7. A disc useable with a blue laser is disclosed as having a light transmitting layer having a thickness of 0.1 mm(0008). Benefits of using these discs include increased recording capacity.

Art Unit: 1795

2003/10099183- discloses use of a 0.6mm and 0.1 light-transmissive layer(0004,0040, and 0081). These correspond to DVD-type and Blue-Ray type discs.

2001/1053122- discloses a light transmission layer having a thickness of 0.6 mm and 0.1 mm (0019 and 0028). These correspond to DVD-type and Blue-Ray type discs.

Response to Amendment

7. Applicant's arguments with respect to claim 1-8 and 11 have been considered but are moot in view of the new ground(s) of rejection. The applicant has added the limitation that the fourth auxiliary layer comprises Si_3N_4 . Formation of a separate fourth auxiliary layer of Si_3N_4 is not disclosed in Horie et al. The examiner has provided the Sakaue reference and the new grounds of rejection to make up for this deficiency.

New claims 14-16 have been rejected for being indefinite. References supporting the examiner's assertion that 0.6mm and 0.1 mm correspond to standards for DVD-type and BlueRay-type discs have been provided in the section for citing pertinent prior art.

8. Any inquiry concerning this communication or earlier communications from

Art Unit: 1795

the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-21 7-91 97 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anna L Verderame/

Examiner, Art Unit 1795

/Mark F. Huff/

Supervisory Patent Examiner, Art Unit 1795